

micrometers, have been developed for such uses. The fibers can be made by a variety of melt processes, including a spunbond process and a melt-blown process. In a spunbond process, fibers are extruded from a polymer melt stream through multiple banks of spinnerets onto a rapidly moving, porous belt, for example, forming an unbonded web. This unbonded web is then passed through a bonder, typically a thermal bonder, which bonds some of the fibers to neighboring fibers, thereby providing integrity to the web. In a melt-blown process, fibers are extruded from a polymer melt stream through fine orifices using high air velocity attenuation onto a rotating drum, for example, forming an autogenously bonded web. In contrast to a spunbond process, no further processing is necessary. Many melt-processed fibers, however, do not have adequate cohesive strength. This can result from the extreme conditions that can cause a breakdown of molecular weights of the polymers used to make the fibers.

What is desired is an adhesive fiber that has improved cohesive strength without losing the tackiness indicative of a pressure sensitive adhesive. In conjunction, it is desirable to create an adhesive fiber that is removable from a substrate with ease without losing the tackiness indicative of a pressure sensitive adhesive. Additionally, a pressure sensitive adhesive fiber that can be used in a stretch removable article, particularly a medical article, is desirable.

Summary of the Invention

This invention is directed to an adhesive fiber (preferably, microfiber) that includes a pressure sensitive adhesive component and an organic polymeric reinforcing material within the pressure sensitive adhesive component. The reinforced adhesive fiber of the invention allows for an improved cohesive strength over the pressure sensitive adhesive component alone, yet the tack of the pressure sensitive adhesive remains substantially unreduced.

→ The present invention also provides stretch removable adhesive articles that include a backing and a pressure sensitive adhesive layer in the form of a nonwoven web, which includes such adhesive fibers, disposed thereon. Preferably, a nonwoven web of the adhesive fibers itself is stretch removable. Preferably, the adhesive fibers are suitable for use on skin and the adhesive

applicant's
disclosure
support for
adhesive
nonwoven
web

article is in the form of a medical article, such as medical tapes, wound or surgical dressings, athletic tapes, surgical drapes, tapes or tabs used in adhering medical devices such as sensors, electrodes, ostomy appliances, and the like.

A nonwoven web of the adhesive fibers has a load at yield point and a maximum load. In one embodiment, the maximum load is at least about 30 grams/centimeter (g/cm) at a basis weight of about 55 grams/meter² (g/m²) when tested according to ASTM D 3759-96 modified according to the procedure described in the Examples Section. In another embodiment, the maximum load is at least about 150% of the load at yield point at a basis weight of about 55 g/m² when tested according to ASTM D 3759-96 modified according to the procedure described in the Examples Section. In one embodiment, a nonwoven web of the adhesive fibers exhibits at least about 50% elongation at break at a basis weight of about 55 g/m² when measured according to ASTM D 3759-96 modified according to the procedure described in the Examples Section.

The reinforcing material can be in a variety of forms. Preferably, it is in the form of one or more fibers, particularly minimicrofibers, although it could be in the form of one or more layers, which can optionally alternate with layers of exposed pressure sensitive adhesive component. Minimicrofibers are preferred, at least because it is believed that this form contributes to enhanced stretch removable characteristics. In certain embodiments, the minimicrofibrous reinforcing material includes substantially continuous fibers within the pressure sensitive adhesive component.

In preferred embodiments, a nonwoven web of reinforced adhesive fiber according to the present invention, particularly minimicrofibrous reinforced adhesive fiber, will display stretch removable characteristics and easy removal from a substrate. Thus, the present invention provides stretch removable articles that include a fiber of the present invention.

The present invention also provides a pressure sensitive adhesive fiber that includes: a pressure sensitive adhesive component; and a reinforcing material that includes a metallocene-catalyzed polyolefin within the pressure sensitive adhesive component; wherein a nonwoven web that includes the pressure sensitive adhesive fiber and having a basis weight of about 55 g/m² has a maximum load of at least about 30 g/cm, which is at least about 150% of the load at yield point, and an elongation at break of at least about 50%.